Ø BEAT

COLORADO SPRINGS, COLORADO

Inside This Issue:

An Attenuator For Fox Hunting	Page 6
El Paso County HF Roundtable	Page 4
Editor's Notes	Page 10
Happy Birthday to ...	Page 6
Local Ham Receives National Hero Nomination	Page 5
"Lowfer" Author Silent Key	Page 11
Meeting Minutes	Page 3
OM/YL Lunch Bunch	Page 5
Past President Silent Key	Page 10
Propagation Report	Page 11
Short Bits and other Articles	Page 5

February 1997

FIRST CLASS MAIL

Pikes Peak Radio Amateur Association, Inc.
P.O. Box 16521
Colorado Springs, Colorado 80935

1 Renew before 01/31/98
RONALD DEUTSCH
NKOP
4305 RIDGELANE DR.
COLO. SPGS., CO 80918

Ø BEAT

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*This Officer/Director is completing the second year of the two-year term to which they were elected.

The *Ø-Beat* is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., PO Box 16521, Colorado Springs, Colorado 80935. For membership and subscription information see the last page of this publication. Monthly advertising rates: Full page, $48; Half page, $24; Quarter page, $12, Business card, $6. These rates are billed quarterly. Send your ad requests and payments to: PPRAA, PO Box 16521, Colorado Springs, Colorado 80935.

Check out the PPRAA page on the World Wide Web! Go to: http://rainbow.rmii.com/~mugele/ppraa/

Deadline for submission of articles or advertisements is the 20th of each month. Submissions are accepted in any form. Articles should be sent directly to the *Ø-Beat* Editor (email to **kdØju@juno.com** is preferred.) Permission is granted to reprint articles provided credit is given to both the author and this publication.

License Exams

License examinations sponsored by the Pikes Peak Radio Amateur Association are held on the 2nd Saturday of February, April, June, August, October, and December.

Testing takes place at 9 A.M. at:

Denver Technical College
225 South Union
Colorado Springs

Everyone is seated on a walk-in basis. Those wishing to take an exam should bring the following items:

1. $6.25 (preferably a check/money order made out to ARRL/VEC) for any exam other than element 1A or 2.
2. Picture identification.
3. A copy of your current amateur radio license, and/or a copy of any examination credit you have, as well as the signed original. **We keep the copies.**
4. A pen, pencils, and a calculator if you need one.

If you have any questions, call Erik Mugele, KGØXE at 596-5345. Please do not call Denver Technical College.

Committee Chairpersons/Contacts

Ø-Beat Editor	Jeff Boyes	NØJLH	577-6211
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Other Organizational Liaisons

ARES Liaison	Mike Stansberry	KØTER	636-1290
CCARC Liaison	Ron Deutsch	NKØP	593-8352
RACES Liaison	Larry Dunn	N9HSW	481-0369

Reminder — General Membership Meeting

The next General Membership Meeting of the Pikes Peak Radio Amateur Association will be on the second Wednesday of this month at the Disabled American Veterans Hall, 6880 Palmer Park Blvd. The meeting will start at 7 PM.

January General Meeting Minutes

The general meeting of the PPRAA was called to order on January 8, 1997 at 7:07 PM, by the President, Jeff, NØJLH. 45 members and guests then introduced themselves. Jeff then read the minutes of the December meeting which were accepted. There was no treasurer's report available at the meeting.
Committee reports followed:
Activity: Renee mentioned that the picnic was the next social activity. It will be held in August, so no action is needed yet.

Assets: Mike, KØTER, gave an update on the inventory assessment. He noted that anyone with club equipment or materials please contact the committee.

Public Service: Mike ask for some hams to help coordinate some of the upcoming minor events. Contact Mike for details or to offer service.

ARES: The group is looking for people with advanced driving/4WD experience. Also needed are hikers/mountain bikers for special needs. Contact the committee with information.

Membership: Les, KCØNC, reminded members that when renewing membership to please fill out the form completely and write or print clearly.

Programs : Aaron noted that next month he is putting on an antenna program. Contact him if you have a project you would you would like to share with the club.
RACES: It was announced that RACES is alive and well. A meeting is scheduled on Jan 16 and ARES/RACES are planning exercises starting in late Jan. and continuing throughout the year.

Swapfest: Carlos noted that a planning meeting is scheduled for Jan 10th. He also indicated the committees desire to go with a D-11 school. Discussion centered on either Doherty or Coronado. Consensus was to have the fest at
Doherty on May 17th (the traditional date for the club swapfest). It was noted that the Club set some-what of a precedent for having the Swapfest in mid May and breaking away from the date was confusing some and may have hurt
economically. A budget for the Swapfest was requested in the amount of $2500. Carlos asked for a sense of the club as to type of prizes. After discussion, it was
agreed to have mainly amateur radio prizes and purchase more prizes at lower cost rather than have one very expensive prize.

Education: Novice classes have begun with 15 people present. Class meets Tuesday and Thursday evenings at the Tesla Museum from 7 to 9pm (6pm for Novice code people).

There was no old business present before the club.

In new business, Norm, NØENN, spoke about a project in '73 magazine for a computer to radio interface. It is apparently easy to build, useful, and inexpensive.

HAMMY of the Year (1996) was presented to Bill, NØNJX. Hammy of the month went to Ken, NØNKP. It was noted that both Hammy tubes are mounted upside down. However, no motions were made to 'rectify' the situation.

The next board meeting is schedules at Bob's home on January. 13. The February. board meeting will be a Greg's (WA2OOD).

The formal meeting ended with a break at 7:43 PM.

Respectfully submitted by Mark, NØEPF
Transcribed by Ron, NKØP

Jan 8, 1997
7:57 PM
After 15 min break members got back together. NØCYR requested $15.00 for supplies for the education committee. It was approved by a majority of members present. The monthly raffle was conducted by Aaron. The program was Home Brew Night.

Amateur Kit Category
NØXFX Winner with Logic probe and pulser kit.

Professional Kit Category

NØUVR , 1st prize Tentec 6mtr transverter and super CMOS keyer
WA2OOD, 2nd prize L-C meter

Professional NON-KIT
W6RML, 1st prize with a color camera for RC airplane
NØNJX 2nd prize with carrier activated transmitter

Amateur NON-KIT
KCØNC 1st prize with Mobile antenna with rotor and direction locator.
Other entries: KD6FLM connector test box and proto board setup.
Meeting adjourned at 8:46

submitted by Ron NKØP

Board of Directors Meeting
Minutes of January 1997

PPRAA Board meeting opened at the home of WB7WHT at 7:05 PM on January 13, 1997. The following members and guests were present: NØJLH, KD6FLM, WB7WHT, KBØSXC, WA2OOD, NØEPF, NKØP, KAØROY, KAØROZ, KCØNC, WBØRTF and KDØJU.

Old Business:
WØYNE still has a key to the mailbox. Need update on club trailer status. Jeff will talk to Mary about it.

New Business:
Next board meeting will be at WA2OOD. A new club is forming in Ellicot, CO. No further info is available at this time.
Rob updated the board on the Hamfest. Prizes were discussed as well as tentative place and date for event. Meetings are tentatively scheduled for the first Saturday of each month at 1Øam at the Police Substation near Fountain and Academy Blvd. Plans are in the works for the 1998 Hamfest.
Courtesy copies of Ø-Beat were approved for 1997.

Les reported the membership as 225 as of Jan 1, 1997. A nomination was made for instructor of the year award by Rob. It was seconded and carried by majority vote of the board.
Motion was made by Rob to donate $200 to Tesla Society for the help in the Novice-Tech classes in 1996. Motion was seconded by Aaron and passed by majority vote of board.
Bill set the Ø-Beat deadline for this month as 17 Feb.
Aaron said Mike KØTER is planning on setting up a Ham station at the Scout Freezeree this year.
The February meeting program will be on Antennas per Aaron.
Gregg has received a few more donations of radio gear for the club. They will be sold at the swapfest or at a future club meeting.

The PPRAA SSC renewal has been mailed to ARRL by Jeff.
Motion was made and passed to reserve the AFA Picnic area again for the club picnic in August.

Renay will start looking into 1997 Xmas party entertainment.
Meeting
Adjourned at 8:12. Submitted by Ron NKØP

El Paso County HF Roundtable

Sunday evenings just after the El Paso County RACES 7:30 PM (local) HF net, on 28.385 MHz.

Everyone is invited to check in.

1997 Swap Fest Committee
The second meeting of the Swapfest 97 Committee was held at the CSPD Falcon sub-station on Saturday, Jan 11 1997.

In attendance were Rob Roller WB7WHT, Phil Pearsall KC5LXC and myself.

Per the club members choice the swapfest will be held Sat 17 May 1997 at Doherty High School, 4515 Barnes Rd.

The raffle prizes agreed upon are:

ICOM IC-707 HF Transceiver

MFJ MFJ-9406X 6 Mtr Transceiver/Mic

MFJ MFJ-259 Antenna SWR Analyzer

Magellan GPS2000 GPS Receiver

The admission price will be increased to $4.00 per person, under 18 years of age will be admitted free. Tables will be increased to $12.00 per table and additional tables will be $10.00.

Phil Pearsall will generate a new flyer and map to give directions and info.

Travis Brann has volunteered to price out the prizes to secure the lowest prices possible.

The next meeting of the Swapfest Committee will be held Sat Feb 1st at 10:00AM at the Falcon sub station.

Submitted: Carlos J. Caro KBØREI

OM/YL
February
LUNCH BUNCH

The Lunch Bunch will get together for lunch and visiting Thursday, February20th, Noon time, at the Hometown Buffet in the shops of the Bluffs 3650 Ausitn Bluffs Parkway in Colorado Springs. An invitation is extended to all of you who can join us.

Rosie Calaway, WAØMNL
471-9965

Short Bits (by WB7WHT)

- Sad news .... Rosie and Russ Calaway WAØMNL and KBØFNM are attending Rosie's brother's funeral. Sorry to hear the news, and I'm sure everyone joins me in offering condolences.
- Be sure to read the back of each QST in the Section News. We have FOUR section officials right here in Colorado Springs, and it's worth keeping up on what they're doing.
- Longmont ARC Hamfest, April 5. Contact Jim Deeming, KBØMED, (303) 651-7764, or jwdeeming@compuserve.com.

Hams Helping Hams (by WB7WHT)

Rosie and Russ Calaway WAØMNL and KBØFNM appreciate the help from John Roth NØQJS and Jack Wood KBØLWE in reinstalling their HF antenna and tower. Seems their tower blew down last spring when some high winds came through the area and they've been off the air for at least 6 months now. Along came John and Jack and they proceeded to install their antenna so well it withstood all the winds high we had in December. Thanks, John and Jack!

Don't Recycle Those Phone Books Yet!

Before you recycle that phone book, think of the last time you were in your car, with autopatch or cell phone capabilities, and wanted to make a phone call but couldn't remember the phone number? If you haven't already done so, take one of the old phone books and toss it in the back seat.

Did you know ... Traffic Newsletter? (by WB7WHT)

I've been checking the club's mail now for several months but I wonder who really knows what comes through our mail. By far the most popular piece of mail is the annual membership renewal. Next most popular is the junk mail. What kind of junk mail, you ask? Another time. But the PPRAA also swaps newsletters with other clubs in the area. These newsletters are usually passed to our editor so any interesting articles can be included in our own Ø-Beat. One newsletter that I've never seen before becoming treasurer, let alone heard of before, is ***The Southwesterner***, a newsletter of the Southwest Traffic Net. Since we have a lot of traffic handlers in the area, you might want to check it out. The editor is Mike WB5COO, 3625 Partridge Ln, Baton Rouge, LA 70809. The publisher is Al K5DPG who can be reached via e-mail at `k5dpg@linknet.net`. The membership / subscription rate is $8. They tend to quote from the Ø-Beat quite often, so turnaround's fair play. Actually I think George Lockhart WBØDUM seems to give ***The Southwesterner's*** editor quite a bit to talk about. What do you do on that traffic net, George, to make them like you so much and talk about you in every issue?

Local Ham Receives National 'Hero' Nomination (by WAØMNL)

Back on June 8, 1996, Ginger Hipszky NØUOD nominated her husband, Skee NØPRY, for Hometown Hero, a local award given by the Colorado Springs Gazette Telegraph for people that have done something outstanding for the community. The byline read "Hero Offers Lifeline to

Happy Birthday!!

Our members with birthdays in February are:
KBØQFY, KBØSHR, KBØVGX, KBØWIX, KDØJU, KFØCT, AB5SI, KØCI, KBØLUE, KBØOEA, KGØYE, KL7IPV, NØCGP, NØENN, NØEPF, NØFTK, NØNJX, NØPRY, NØRNQ, NØSIG, NØTUI, NØWTW, NØYTW, NØZDV, NØZLY, N7AAQ, NF7U, WØLKD, WØRW, W3TMR, W6RML, and WB6YXD.

all the lives he's saved over the past 23 years by dangling over cliffs on ropes and trudging through snow to rescue injured hikers and climbers.

Once again, Skee, a member of the Pikes Peak Radio Amateur Association and ARES, received a second hero's award, this time by CBS. Skee was honored on the Hero of the Day part of the CBS This Morning program on October 27, 1996.

For those that don't know Skee, he's a member and past president of the El Paso County Search and Rescue, and he's done technical climbing since he was 11 and has been rescuing people since he was 15. When he was fifteen one of the group of climbers he was with fell 110 feet and, with no one around (he wasn't an amateur licensee at that age to call for help) the group became the rescuers! Ever since then he's been interested in rescue work. He's been in the EPCSAR for the past 23 years.

Well, the local affiliate, KKTV-11, got in the picture once they found out that a local was being mentioned on the national program. Both Skee and I were in the KKTV studios and live on the air later that morning and spoke about Search and Rescue, and about how we met through amateur radio.

nØuvr@juno.com

Others in Need." Ginger believed that Skee should be recognized for

---

From Dave Kurth, NØUVR

An Attenuator For Fox Hunting

Radio direction finding or fox hunting has been apart of amateur radio since the first hams started transmitting. Different equipment and radio direction methods have developed over the years. Fox hunting equipment can vary from one using only his hand held transceiver and block with his body, to computer controlled antenna arrays using Doppler shift algorithms. For most people though, a beam antenna, an attenuator, and an radio are more than sufficient.

A beam antenna will receive a signal with a higher signal strength when pointed in the direction of the signal source. Most all radios have a signal strength meter that will indicate when the signal is the strongest. So if all one has to do is point the antenna in the direction of the strongest signal, why would one want an attenuator? The reason is most radios S-meters do not behave in a logarithmic fashion. The meter will usually be full scale for any direction the beam antenna is pointed. This condition makes pointing the beam directly at the signal source difficult. The attenuator solves this problem. It is placed between the antenna and radio, and adjusted so that the receive signal strength can be reduced to where the S-meter sits in the middle of its range. As the beam is rotated back and forth, small changes in signal strength can be easily seen on the S-meter.

Beam antennas are quite easy to obtain. There have been many plans in QST and other magazines showing various 3 and 4 element yagi beam antennas. I've been using the

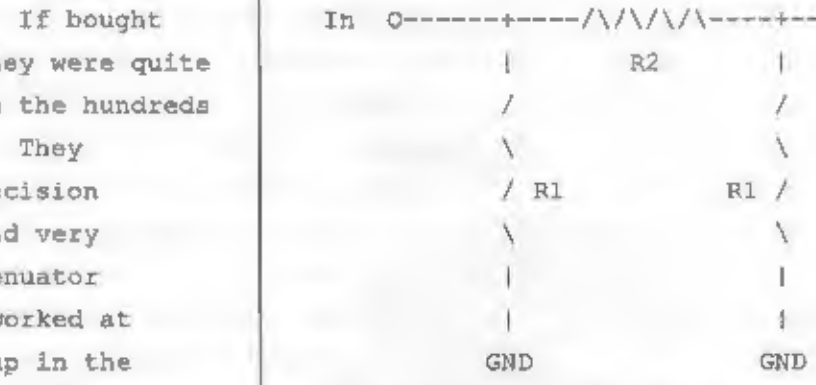
"7dB for 7 bucks" antenna that was described in the April 1993 (page 54) issue of QST.

Attenuators though are a little harder to come by. Hewlett-Packard makes the model 355 attenuator that goes from Ø to 12Ø dB in 1Ø dB steps. If bought brand new, they were quite expensive (in the hundreds of dollars). They contained precision resistors, had very accurate attenuator values, and worked at frequencies up in the gigahertz range. For fox hunting with an radio, 12Ø dB of attenuation is useless. The amount of signal that leaks through the case will be more than what comes through the attenuator. We only need to operate in the VHF range, so we can make an attenuator that is easy to build. We also don't high precision, just something that gets our S-meter around the mid scale region.

I have built a simple attenuator that will cover from Ø dB to 65 dB in 5 dB steps using only four switches. To do this, the attenuator has four stages consisting of 5 dB, 1Ø dB, 2Ø dB, and 3Ø dB of attenuation.

HOW IT WORKS

The first step is to use a "PI" section. This circuit has three resistors connected in a configuration that looks like the Greek letter pi. Two resistors are the same (shown as R1), and the third resistor is labeled as R2. A rough ascii diagram is shown below.



There are two resistor values to calculate, and two equations to satisfy. The first requirement is the amount of attenuation we want in the section. The second is the impedance looking into the attenuator be the same as the load impedance on the output of the section. Doing a lot of algebra, we get the following equations.

$$R1 = ZL * \left(\frac{1 + G}{1 - G}\right)$$

$$R2 = ZL * \left(\frac{1 - G^2}{2G}\right)$$

where G is the gain (which is less than 1 for attenuation), and ZL is the desired impedance. We all use radios designed for 5Ø ohm impedance, so ZL is 5Ø. The last step is to determine the gain G we want. An attenuation of 5 dB (actually a gain of -5 dB) can be related to voltage by the following formula.

$$dB = 2Ø * LOG (Vout / Vin)$$

The voltage out divided by the voltage in is gain G in our case. By rearranging and substituting, you get:

G = 10^(db / 20)

Using this information, the following table can be calculated.

dB	G	ZL	R1	R2
0.00	1.00000	50.00	infinity	0.00
-5.00	0.56234	50.00	178.49	30.40
-10.00	0.31623	50.00	96.25	71.15
-20.00	0.10000	50.00	61.11	247.50
-30.00	0.03162	50.00	53.27	789.78

You are going to have real trouble finding a 178.49 ohm resistor! If you get out a table of the standard 5% 1/4 watt resistors, you come up with the following values. (Formulas for ZL and G in terms of R1 and R2 are shown at the end of the article.)

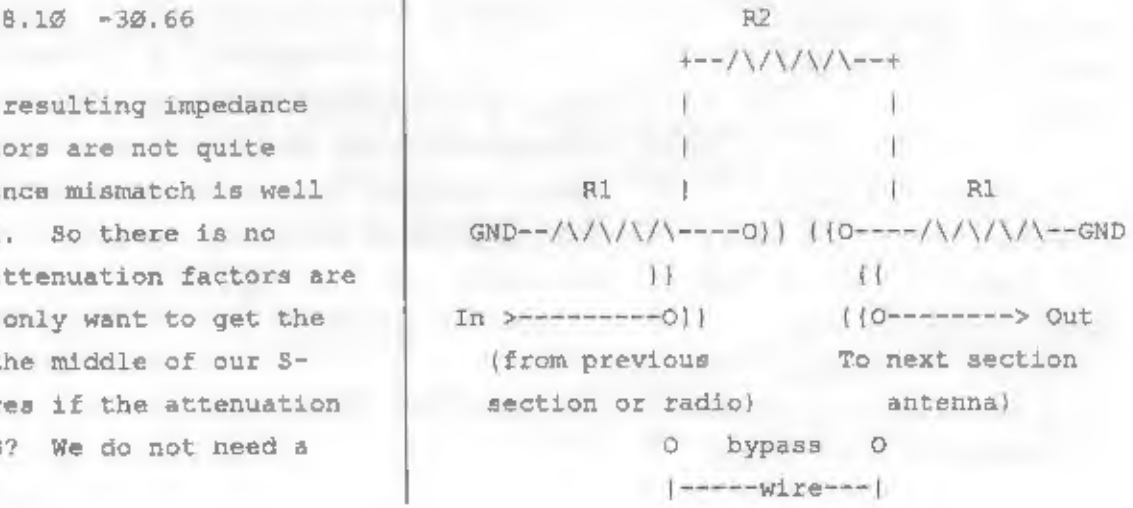
R1	R2	ZL	dB
180	30	49.92	-4.95
100	68	50.37	-9.63
62	240	50.34	-19.68
51	820	48.10	-30.66

You notice that the resulting impedance and attenuation factors are not quite correct. The impedance mismatch is well below a SWR of 1.1:1. So there is no problem here. The attenuation factors are close, and since we only want to get the received signal in the middle of our S-meter range, who cares if the attenuation is 25 dB or 24.63 dB? We do not need a precision attenuator, so the above values will work with no problem.

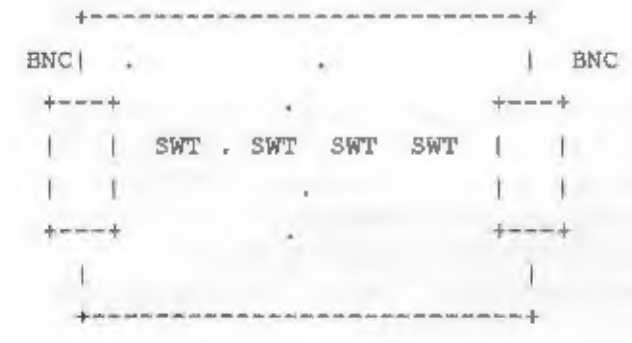
CONSTRUCTION

I built my attenuator using double sided printed circuit board. It was convenient because I have the tools to cut it, and a soldering iron and solder allowed me to solder the sides together to make a box that is mechanically sound and shielded at the same time. Also, since the box is ground, I soldered the GND end of the resistors directly to the copper board. Since this attenuator is operating at VHF frequencies, you want to keep lead lengths as short as possible. If you don't want to use printed circuit board, you can buy a project box at Radio Shack that is either plastic or aluminum. Aluminum, of course, would be a better RF shield. In either case, you could lay strip of rinted circuit board inside the box, and solder all the R1 resistors (see below) to it.

After locating the proper resistors, you'll need to get 4 double-pole, double-throw switches. You can use either slide switches, or the toggle switches. Each section is built similar to the following diagram.



Each section is connected to the next section is a serial fashion. In looking at the Hewlett-Packard attenuator, they isolated each section from each other by passing the output of one section through a "wall" between the sections to the input of the next. I did use another piece of copper circuit board to make a wall between each section. The wall had a hole in the middle of it, and the wire from one section passed through the hole to the input of the next section. The resulting attenuator will then look like:



OPERATING THE ATTENUATOR

When the switch in the up position, that section is "in". When the switch in the down position, that section is bypassed and the signal is passed through. Since the amount of attenuation simply adds when expressed in dB, you simply add the sections that are "in" to arrive at the total attenuation. If you have the 5, 1Ø, and 3Ø dB sections "in", then you have 45 dB of attenuation.

You will see that because of the symmetry of the circuit, the attenuation and operation are the same if the radio is connected to the left side and the antenna is on the right, or the other way around. So it doesn't matter which way you connect it between your antenna and radio.

You will also note that the resistors used are only 1/4 watt. So unless you want black resistors and lots of smoke, don't transmit through the attenuator with 5 watts, 1 watt, or even 1/2 watt. Of course, if you bypass all the sections by sliding all switches in the down position, you can transmit through the box without damaging the resistors. However, Murphy's Law says that sooner or later, you'll forget and leave a section in. If you then transmit, poof, you'll get smoke!

During a fox hunt, set all the switches off. Swing your beam until you can hear a signal. If the signal is full scale on the S-meter, switch in the 2Ø dB section. If the signal disappears, turn off the 2Ø dB section and try the 1Ø dB section. If the signal was still too strong after the 2Ø dB section, switch in the 1Ø dB. You just continue either adding or subtracting attenuation until you get the signal near the halfway point of your S-meter. Swing your beam back and forth until you find the direction of the strongest signal. That's the direction of your fox! You can then make note of the total attenuation, and head in the fox's direction to take your next bearing. You should find that more attenuation is necessary as you get closer to the fox. If it stays the same or actually gets less, you have a problem. You are either going the wrong way, you've gotten behind a hill or other obstruction, or you maybe be chasing a reflection off the foothills or a mountain. But that's a another story for another day.

Build your attenuator, get your beam and radio, and come try a fox hunt. It's a lot of fun, and a good learning experience.

OTHER FORMULAS

Given R1 and R2, ZL and G can be found using the following formulas.

$$ZL = \sqrt{\frac{(R1^2*R2)}{(2*R1+R2)}}$$

$$G = \frac{2*(R1+R2)-\sqrt{4*R2*(2*R2+R2)}}{2*R1}$$

EDITORS NOTES
by Bill Pierce, KDØJU

The)-Beat is your newsletter; so keep those articles coming in.

The editor now has a packet address. You can send SHORT articles via packet to:

KDØJU@NØMPI.#NECO.CO.USA.NOAM

The following was received via e-mail from ARRL.

Special Bulletin 2 ARLXØØ2
From ARRL Headquarters
Newington CT January 11, 1997
To all radio amateurs

SB SPCL ARL ARLXØØ2
ARLXØØ2 Past ARRL President SK

Past President Carl L. Smith, WØBWJ, died January 9, 1997. He was 78 and had been in poor health for several years. Services will be held Sunday, January 12, at 2 PM at Montclair Methodist Church, 12th Newport, in Denver. Arrangements are being made by Horan-McConahy, 1Ø91 S Colorado Blvd, Denver.

Carl Smith's contributions to the ARRL spanned four decades. He served as Colorado SCM in 1955-56, Rocky Mountain Division Vice Director in 1957-58, Director in 1961-7Ø, and was elected Vice President in 197Ø. He became Honorary Vice President in 1972 and in 1974 was again elected Vice President, moving up to First Vice President in 198Ø (and also Vice President of IARU). Smith was a member of the successful IARU WARC-79 team. He was First Vice President in November 1983 when President Vic Clark, W4KFC, died in office, and he succeeded Clark as President. He served in that office until the following March.

As a pilot for Western Airlines, Smith made news in the 197Øs when he safely landed a fully loaded Boeing 7Ø7 passenger jet that had a jammed nose wheel on a foamed runway at Honolulu International Airport.

This space could have (should have?) been yours!!

Remember, this is **our** newsletter! Contact the editor with your suggestions!

QST de W1AW
Special Bulletin 3 ARLX003
From ARRL Headquarters
Newington CT January 24, 1997
To all radio amateurs

SB SPCL ARL ARLX003
ARLX003 Ken Cornell, W2IMB, SK

"Lowfer" author, experimenter Ken Cornell, W2IMB, SK

Low-frequency author and experimenter Ken Cornell, W2IMB, of Point
Pleasant Beach, New Jersey, has died. He was 79. Cornell was, perhaps, best known for The Low and Medium Frequency Radio Scrap
Book series (the 10th edition was published recently). He also authored many articles over the years and was a frequent contributor to Lowdown, the newsletter of the Longwave Club of America.

NNNN
/EX
ZCZC AP04
QST de W1AW
Propagation Forecast Bulletin 4
ARLP004
From Tad Cook, KT7H
Seattle, WA January 24, 1997
To all radio amateurs

SB PROP ARL ARLP004
ARLP004 Propagation de KT7H

We are still at the solar minimum, with very little activity to report. Since there are no really active regions that we know of on the solar surface, there is no activity to forecast as the solar surface rotates relative to the Earth.

This week's average solar flux was exactly the same as the week previous, and the sunspot numbers were barely higher. Unlike the previous week, there were no periods of geomagnetic activity, and
the A index stayed in the single digits.

The next few weeks are expected to stay the same, with the solar flux around the low to mid seventies, and the A index around five.
The A index may jump up to around ten on February 3, and again
around February 6-9.

Sunspot Numbers for January 16 through 22 were 16, 12, 34, 0, 0, 0 and 0 with a mean of 8.9. 10.7 cm flux was 74.8, 74.1, 74.6, 75.3, 76.8, 74.1 and 73, with a mean of 74.7. Estimated planetary A indices for the same period were 3, 2, 5, 4, 5, 9, and 5, with a mean of 4.7.

This space could have (should have?) been yours!!

Remember, this is **our** newsletter! Contact the editor with your suggestions!

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Address _____

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Call _____ License Class _____ Telephone _____

Email Address _____

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One year membership rates. (Year starts with the month you receive your first issue.)

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Over 65 $12.00 [ ] — Family Membership (both over 65) $12.00 [ ]
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Additional Names: _____ Call _____ Class _____

Please Note: You must submit a completed application form along with your check to the Treasurer for both new members as well as renewals. Thank you.

PLEASE TYPE OR PRINT CLEARLY!